Philips Medical Systems

FIELD CHANGE ORDER — Service

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service recommendation

APPLIES TO :

All OPTIMUS RAD / RF generators equipped with Rotor Control HS
9890 000 0221x 4512 104 7140x
4512 104 3379x

TITLE :

ENK 2 contact problems

LIST OF PAGES AND DRAWINGS :

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PRECAUTION :

OPTIMUS RAD
Before carrying out any service work release mains circuit breaker ENF 1 to ensure that the installation is dead.

OPTIMUS RF
Before carrying out any service work disconnect the installation with the mains switch so that the system is no longer alive.
Switching off mains circuit breaker ENF1 only is not sufficient.

INTRODUCTION

Environment reasons resulted in relay contacts without the use of cadmium which hardened the contact area.

Being an advantage for the environment one has to face its disadvantageous sideeffects.
Contacts might weld if the switched current has a value in the upper range of the contactor specification.

Such values might be attained during turn-on of the generator depending on the mains condition and the turn-on moment.

It also depends on the configuration and the mains supply data.

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RAD and R/F generators being installed straight at a low resistance 400V mains, R/F generators with a PDU transformer or RAD generators with a 50kW transformer 220 ↔ 380V might have this effect.
RAD generators with a 480/460/440V ↔ 400V transformer will not have this effect..

In case of a (or more) welded contact(s) it might happen that the generator does not turn off all functions when the OFF button has been activated.

The mains phase supervision does not check the mains voltage level. It works in a different way:

- Phase 1 off:
  - ⇒ contactor K2 can not be energized
  - ⇒ no low voltage power supply
- Phase 2 off:
  - ⇒ no supply for filament circuit
- Phase 3 off:
  - ⇒ no supply for power-on circuit
  - ⇒ no supply for high tension switchover unit (not present at single tube generators)

In case of a RAD 480/460/440V ↔ 400V transformer there is no turn-on possible under normal circumstances if one of the primary phases is missing.

<u>Effects if contact(s) weld and the OFF button has been activated:</u>

- Phase 1 welded, 2 + 3 open:
  - ⇒ 230V AC still present on backpanel
  - ⇒ low voltage power supply still on
  - ⇒ control desk still on but displaying error of missing filament current
  - ⇒ 230V AC still present at 26/230V adaptation unit (option)
  - ⇒ Stand of any kind still in operation if connected to phase 1

- Phase 2 welded, 1 + 3 open:
  - ⇒ 230V AC still present on backpanel
  - ⇒ filament circuit still fed with 230V, no output due to missing commands
  - ⇒ Stand of any kind still in operation if connected to phase 2

- Phase 3 welded, 1 + 2 open:
  - ⇒ 230V AC still present at the high tension switches (in case of a 2 tube transformer) and the switching unit WG
  - ⇒ Stand of any kind still in operation if connected to phase 3
  - ⇒ contactor K11 still energized feeding 3 - phase mains output 1 + 2 of R/F generators (which is the entire geometry and II/TV)

Combinations are possible.
The converter DC supply discharge phase will take much longer as the discharging contact ENK 2 :41/42 can not be closed.
The entire system will stay alive in case all three phases weld.

The emergency off line, if installed at EZX4:1 and :2, will have the same effect as if one tries to turn off the generator.

Note:
If contactors are energized on an unidentified shortcircuit after a mains breaker release contacts always weld. These contactors must always be replaced.

<u>Measures and precautions:</u>

Turn off the generator only with the switch-off button of the generator control desk.

Measure mains phases at contactor ENK2 against ground (chassis or ENX1101/1102). There should be no 230VAC ±10%, it must be 0V.

- K2:1 phase 1
- K2:3 phase 2
- K2:5 phase 3

If at least one of the phases still has 230V the contactor should be replaced. As it is not possible to get the snapped-on auxilary contacts off the main contactor body also these have to ordered.
See: MODIFICATION KIT / PARTS REQUIRED

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Additional measures can be implemented. This information can be given by

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MANPOWER / TIME TO COMPLETE

2 hours 1 engineer

TOOLS & TEST EQUIPMENT

Standard tool set

MODIFICATION KIT / PARTS REQUIRED

For all generators mentioned under APPLIES TO, the following parts can be ordered at SSA Hamburg.

1 x contactor ENK2	2422 132 06621
3 x auxilary contact N/O	2422 135 04355
1 x auxilary contact N/C	2422 135 04023
1 x power-on current limitation kit	4512 104 91281

PROCEDURE

Replace ENK 2
install a NTC kit in the Rotor Control HS unit to limit the power-on capacitor charge current to a specified value.
Detailed procedure will be delivered with the kit.

PARTS DISPOSAL

All parts are to be disposed of in a safe way in accordance with local Safety Regulations.

DOCUMENTATION

File this FCO and the instruction manual in binder: OPTIMUS under Tab 8

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